REMARKS

Status of the Claims

Claims 1-25 are pending in the application. Claims 13-15 and 20-25 have been withdrawn as drawn to a non-elected invention. Claims 4, 5, 7, 11, 12, 18, and 19 have been withdrawn as being drawn to a non-elected species. Claims 2 and 3 have been canceled with this amendment. Claims 1, 16, and 17 have been amended with this amendment.

Claim Amendments

Claim 1 has been amended to recite that the assay system comprises cultured cells that express the PLK4 polypeptide and have defective beta-catenin function. Support for the amendment is found throughout the specification, and particularly at, for example pages 24-27.

Claim 16 has been amended to recite a method of identifying a candidate beta catenin pathway modulating agent, said method comprising the steps of: (a) providing a first assay system comprising a PLK4 polypeptide or nucleic acid, wherein the assay system comprises cultured cells that express the PLK4 polypeptide and wherein the assay system is capable of detecting the activity or expression of PLK4; (b) contacting the assay system with a test agent; (c) determining the activity or expression of the PLK4 polypeptide or nucleic acid in the assay system in the presence or absence of the test agent of step (b) wherein a change in PLK4 activity or expression between the presence and absence of the test agent identifies the test agent as a candidate beta catenin pathway modulating agent; (d) providing a second assay system comprising cultured cells expressing PLK4 capable of detecting a change in the beta catenin pathway; (e) contacting the second assay system with the test agent of step (b); and (f) measuring the beta catenin pathway in the presence or absence of the test agent, wherein the beta catenin pathway is measured by measuring the transcriptional activation of TCF target genes or by measuring the transcriptional activation of beta catenin and wherein the detection of a difference in the

presence and absence of the test agent confirms the test agent as a candidate beta catenin pathway modulating agent. Support for the amendment is found throughout the specification, and particularly at, for example 19-32.

Claim 17 has been amended to recite that the first assay system and/or the second assay system comprises cultured cells having defective beta catenin function. Support for the amendment is found throughout the specification, and particularly at, for example pages 24-27 and 31-32.

Amendments to the claims are made without prejudice and do not constitute amendments to overcome any prior art or other statutory rejections. Additionally, these amendments are not an admission regarding the patentability of subject matter of the amended claims and should not be so construed. Applicant reserves the right to pursue the subject matter of the previously filed claims in this or in any other appropriate patent application.

Claim Objections

The Office Action stated that Claim 3 is free of the art but is objected to as being dependent upon a rejected base claim. The Office Action stated that the claim would be allowable if rewritten in independent form to include the limitations of the base claim. Applicants have amended claim 1 to include the elements of claim 3. Accordingly, Applicants believe the claims are in condition for allowance.

35 U.S.C. § 112, Second Paragraph, Rejections

Claims 16 and 17 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because the phrase "measuring the beta catenin pathway" is allegedly unclear. Applicants respectfully traverse the rejection.

The Office stated that claims 16 and 17 are indefinite because it is allegedly unclear what is measured and what step is conducted in step (f) of the claimed method. Without acceding to the merits of the rejection and solely to advance prosecution, Applicants have amended claim 16 to recite that the beta

catenin pathway is measured by measuring the transcriptional activation of TCF target genes or by measuring the transcriptional activation of beta catenin.

Applicants submit that the claimed methods are clear and definite. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 16, and 17 under 35 U.S.C. § 112, second paragraph.

35 U.S.C. § 102 Rejections

Claims 1, 2, 6, 8, and 9 were rejected under 35 U.S.C. 102(b) as being allegedly anticipated by US Patent 5,976,893 (the '893 patent). Applicants respectfully traverse the rejections.

The Office alleged that the '893 patent teaches providing tumor cells comprising SAK (PLK4) nucleic acid/protein, contacting the tumor cells with a SAK antisense nucleic acid, and determining a decrease in cell proliferation in the presence of SAK antisense as compared to the absence of SAK antisense. The Office stated that step(c) of claim 1 (determining the activity or expression of the PLK4 polypeptide/nucleic acid in the presence or absence of the test agent) was disclosed in the '893 patent by reporting the results of a cell proliferation assay in the presence or absence of SAK antisense (Example 4). The Office concluded that the method of the '893 patent would necessarily identify a candidate beta catenin pathway modulating agent and therefore teaches the same steps as the instantly claimed methods.

Under 35 U.S.C. § 102, a claim is anticipated only if each and every element as set forth in the claim is found in a single art reference. *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 10533 (Fed. Cir. 1987); *Structural Rubber Products Co. v. Park Rubber Co.*, 749 F.2d 707, 716 (Fed. Cir. 1984) (All elements of the claimed invention must be contained in a single prior art disclosure and must be arranged in the prior art disclosure as in the claimed invention); M.P.E.P § 2131. The identical invention must be described or shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920

(Fed. Cir. 1989); *Chester v. Miller*, 15 USPQ2d 1333 (Fed. Cir.1990); M.P.E.P. § 2131.

Applicants submit that the '893 patent does not teach all of the elements of the presently claimed methods. The claims as amended require, among other things, an assay system comprising cultured cells that express the PLK4 polypeptide and have defective beta-catenin function. As noted by the Office, the '893 patent does not mention the beta-catenin pathway; nor does it teach an assay system comprising cultured cells that have defective beta-catenin function.

Applicants submit that the '893 patent does not anticipate the present claims because it fails to teach each and every step of the claimed methods. Accordingly, Applicants respectfully request withdrawal of the rejections under 35 USC § 102 (b) in view of the '893 patent.

Claims 1, 2, 6, 8, and 9 were rejected under 35 U.S.C. 102(b) as being allegedly anticipated by US Patent 7,413,870 (the '870 patent). Applicants respectfully traverse the rejections.

The Office alleged that the '870 patent teaches methods of identifying modulators of SAK (PLK4) comprising providing an assay system comprising SAK nucleic acid; contacting the assay system with test agents including antisense SAK, and measuring the expression or activity of SAK, or cellular proliferation, in the presence or absence of the test agent. The Office concluded that the method of the '870 patent would necessarily identify a candidate beta catenin pathway modulating agent and therefore teaches the same steps as the instantly claimed methods.

Applicants submit that the '870 patent does not teach all of the elements of the presently claimed methods. The claims as amended require, among other things, an assay system comprising cultured cells that express the PLK4

polypeptide and have defective beta-catenin function. As noted by the Office, the '870 patent does not mention the beta-catenin pathway; nor does it teach an assay system comprising cultured cells that have defective beta-catenin function.

Applicants submit that the '870 patent does not anticipate the present claims because it fails to teach each and every step of the claimed methods. Accordingly, Applicants respectfully request withdrawal of the rejections under 35 USC § 102 (b) in view of the '870 patent.

35 U.S.C. § 103 Rejections

Claims 1 and 8-10 were rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,976,893 (the '893 patent) or US Patent 7,413,870 (the '870 patent) in view of Hudziak et al (Antisense & Nucleic Acid Drug Development, 2000, 10:163-176).

The Office relied on the teaching previously described above for the '893 and the '870 patents, but stated that neither patents teach that the SAK antisense test agent is a phosphothioate morpholino oligomer (PMO). The Office stated that Hudziak et al teach that PMOs are a known class of antisense agents that can be used in cell proliferation inhibition assays and have many properties considered desirable for antisense agents.

According to the Office, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to substitute the antisense oligos of the '893 and '870 patents with the PMOs described in Hudziak et al. The Office stated that one would have been motivated to use PMOs with a reasonable expectation of success as antisense agents in the disclosed assays of the '893 and '870 patents, given that Hudziak allegedly teaches that PMOs are known and successfully used in cell proliferation assays, and have many properties considered desirable for use as antisense agents.

However, among other things, to meet the requirements for a *prima facie* case of obviousness, the Office must demonstrate that the reference(s) teaches

or suggests all the limitations of the claims. Specifically, the Board of Patent Appeals and Interferences (BPAI) has stated that "obviousness requires a suggestion of all limitations in a claim." *CFMT, Inc. v. Yieldup Intern. Corp.,* 349 F.3d, 1333, 1342 (Fed. Cir. 2003) (citing *In re Royka,* 490 F.2d 981, 985 (CCPA 1974)).

As discussed above, the teachings of the '893 and '870 patents fail to contemplate or mention the beta-catenin pathway. In the absence of any teaching whatsoever of the beta-catenin pathway and the association between PLK4 and the beta-catenin pathway, the '893 and '870 patents fail to teach a method of identifying a beta-catenin pathway modulating agent comprising providing a first assay system capable of detecting the activity or expression of PLK4 and a second assay system capable of detecting a change in the beta catenin pathway. The '893 and '870 patents thus fail to teach all of the limitations of the presently claimed screening assays. The Hudziak reference is not directed to PLK4 or the beta-catenin pathway and therefore also fails to teach or suggest the claimed method.

Thus, Applicants submit that the Office has failed to establish a *prima facie* case of obviousness. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection based on the combined teachings of the '893 or '870 patent and Hudziak et al.

CONCLUSION

In view of the foregoing, the applicants believe the claims as amended are in condition for allowance. If it is believed that such contact would expedite prosecution of the present patent application, the Patent Office is urged to contact the undersigned.

Respectfully submitted,

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